

REMARKS

The application has been reviewed in light of the Non-Final Office Action mailed January 17, 2006. At the time of the Non-Final Office Action, claims 1-16 were pending in this application. Claims 1-16 have been rejected.

Claim Rejections 35 U.S.C. § 103(a) - Norman in view of Chen, Arribau, and Cedillo

Claims 1, 3-6, 8-10, and 13-15 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Norman et al. (5,799,734) ("Norman") in view of Chen et al. (6,168,352) ("Chen"), Arribau (5,904,419) and Cedillo et al. (5,441,340) ("Cedillo").

Applicants respectfully traverse this rejection as to claims 1, 3-6, 8-10, and 13-15.

Norman discloses a method of forming and using particulate slurries for well completion. The method includes the step of withdrawing a gelled treatment fluid from a vessel 10 through conduit 11 into a metering device 12, which introduces the gelled treatment fluid into a pressurizing pump 14 through a conduit 13, which in turn induces the gelled treatment fluid into wellbore 16. Col. 3, lines 6-10. The method further includes the step of withdrawing a particulate slurry from a vessel 20 through a conduit 21 into a metering device 22, which introduces the particulate slurry into pressurizing pump 14 through a conduit 23. *Id.* at lines 36-38. The particulate slurry admixes with the aqueous gelled fluid within pump 14 prior to introduction in wellbore 16. *Id.* at lines 38-40. According to Norman, the slurry is preferably prepared at least about four to six hours prior to the treatment and is preferably prepared offsite. *Id.* at lines 40-45.

Norman fails to disclose a centrifugal pump, which mixes a fracture fluid with a sand suspension, and a separate pump that pumps the mixture downhole into the subterranean

formation. Norman further fails to disclose measuring the concentration of the mixture being discharged from the centrifugal pump and comparing the measured concentration of the mixture to a desired concentration of the mixture.

Chen discloses an apparatus for producing a high density slurry and paste backfills for use in mining operations. Examiner relies on Chen for disclosing a pinch valve for controlling the flow of slurries. Col 10, lines 53-60. However, Chen fails to disclose virtually every other element of the claimed invention.

Arribau discloses an apparatus for mixing solids and a liquid. Examiner states that “[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to use the blender of Arribau instead of the T-junction of Norman et al. in view of Chen et al. This would be done to provide more efficient mixing of the fracture fluid and[] the sand suspension.” Applicants respectfully traverse this reasoning. Contrary to Examiner’s assertion, Arribau does not describe mixing a sand suspension with fracture fluid. Arribau specifically discusses the problems associated with mixing *solids* with a liquid.

Cedillo discloses a control unit 100 for controlling the density of a well fracturing slurry by using feed backs from a flow meter 80 and densometer 85. However, Cedillo fails to disclose a system for controlling the density of a mixture of a sand suspension and a fracturing fluid. The Examiner also asserts that it would have been obvious to use the computer control of Cedillo with the apparatus of Norman in view of Chen and Arribau. The Examiner does not indicate any teaching to combine Cedillo with Norman in view of Chen and Arribau. Rather, The Examiner simply states that “[t]his would be done so that all the mechanisms could be controlled from one location and allow the user readouts of the current status of the apparatus.”

Turning specifically to the claims, none of the references alone or in combination discloses the unique combination of a centrifugal pump for mixing a fracture fluid and a sand suspension and a *separate* pump for pumping the mixture downhole. At best, Norman discloses a single pump which both mixes the treatment fluid and particulate slurry and pumps it downhole. Chen in turn discloses a screw mixer 92, but no pump. Arribau discloses a pump for mixing but is silent as to any type of pump for pumping downhole. Cedillo discloses a blender for mixing sand and water, but no pump.

The combined references, therefore, fail to disclose at least one claim limitation of independent claims 1 and 8. Therefore, independent claims 1 and 8 and claims 3-6, 9, 10, and 13-15 dependent therefrom, are believed patentable over the combination of Norman, Chen, Arribau, and Cedillo. Accordingly, the Examiner's rejection of these claims as being unpatentable over Norman in view of Chen, Arribau, and Cedillo should be withdrawn.

Accordingly, claims 1, 3-6, 8-10, and 13-15 are patentable over Norman in view of Chen, Arribau, and Cedillo for at least the reasons stated above. Therefore, Applicants request that Examiner withdraw his rejection of these claims and allow them to issue.

Claim Rejections 35 U.S.C. § 103(a) - Norman in view of Chen, Arribau, Cedillo, and Samuel

Claims 2, 7, 11, 12, and 16 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Norman in view of Chen, Arribau, Cedillo, and Samuel et al. (6,306,800) ("Samuel").

Applicants respectfully traverse this rejection as to claims 2, 7, 11, 12, and 16.

As discussed above, Norman, Chen, Arribau, and Cedillo, fail to disclose a centrifugal pump for mixing a fracture fluid and a sand suspension and a *separate* pump for pumping the mixture downhole. Likewise, Samuel lacks at least this feature. Samuel discloses a viscoelastic surfactant fluid to increase hydrocarbon production. This fluid may be blended or mixed with fracture fluid prior to pumping downhole. However, there is no indication in Samuel that a centrifugal pump is used for mixing a fracture fluid and a sand suspension.

Additionally, contrary to the Examiner's statement that “[t]hese streams include a liquid additive that can be a breaker fluid,” Samuel does not disclose that the viscoelastic surfactant fluid can be a breaker fluid, a clay control fluid, a cross-linking agent, or a pH control agent. Rather, Samuel indicates that these are undesirable supplementary additives required to use polysaccharides successfully (col. 2, lines 18-27). Further, Samuel does not disclose a positive displacement pump that injects a liquid additive into the centrifugal pump. As noted above, Samuel does not disclose a centrifugal pump. Nor does Samuel disclose a positive displacement pump to inject liquid additive to the mixer or blender, particularly one that is electronically connected to the electronic control system.

Accordingly, claims 2, 7, 11, 12, and 16 are patentable over Norman in view of Chen, Arribau, Cedillo, and Samuel for at least the reasons stated above. Therefore, Applicants request that the Examiner withdraw his rejection of these claims and allow them to issue.

Claim Rejections 35 U.S.C. § 103(a) - Additional Comments: Motivation to combine

Examiner's reliance on the combination of four (or five) separate references for an obviousness rejection is indicative of the non-obviousness of the claims under § 103(a). While reliance on a large number of references in a rejection does not necessarily weigh against the

obviousness of the claimed invention.¹ Applicants contend that the fact that numerous references are required indicates that Examiner is using impermissible hindsight reconstruction.

The Examiner has failed to provide any motivation as to why anyone of ordinary skill in the art would combine the four (or five) recited references, in the manner suggested. Indeed, there is no teaching or suggestion in any of the references themselves, as to why a person of ordinary skill in the art would pick only one element from one reference, another element from another reference, several elements from yet another reference, and several more elements from still another reference. Neither the references themselves, nor any other reference supplies the necessary motivation to combine four or five references in the manner suggested by Examiner. The only way to get the proposed combination is through impermissible hindsight.

Under *In re Gorman* and other Federal Circuit precedent, it is impermissible to engage in a hindsight reconstruction of the claimed invention, using Applicants' structure as a template and selecting elements from references to fill the gaps. To find obviousness, "there must be some reason, suggestion, or motivation found in the prior art whereby a person of ordinary skill in the field of the invention would make the combination. That knowledge can not come from the applicant's invention itself." *In re Oetiker*, 977 F.2d 1443, 1447 (Fed. Cir. 1992). Since the Examiner has cited no prior art suggesting a motivation to combine, claims 1, 3-6, 8-10, and 13-15 are patentable over Norman in view of Chen, Arribau, and Cedillo, and claims 2, 7, 11, 12, and 16 are patentable over Norman in view of Chen, Arribau, Cedillo, and Samuel.

¹ *In re Gorman*, 933 F.2d 982 (Fed. Cir. 1991).

SUMMARY

In light of the above remarks, Applicants respectfully submit that the application is now in condition for allowance and earnestly solicit early notice of the same. Should the Examiner have any questions, comments or suggestions in furtherance of the prosecution of this application, the Examiner is invited to contact the attorney of record by telephone, facsimile or electronic mail, as indicated below.

Applicants believe that there are no fees due in association with the filing of this Response. However, should the Commissioner deem that any fees are due, including any fees for any extensions of time, Applicants respectfully request that the Commissioner accept this as a Petition therefore, and direct that any fees be debited from Halliburton Energy Services, Inc.'s Deposit Account No. 08-0300 (Reference No. HES 2003-IP-010088).

Respectfully submitted,



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Robert A. Kent
Registration No. 28,626
Halliburton Energy Services, Inc.
2600 Second Street
P.O. Drawer 1431
Duncan, OK 73536-0440
Telephone: 580.251.3125
Facsimile: 580.251.3917
email: robert.kent1@halliburton.com

ATTORNEY FOR APPLICANTS